

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Stantec  
1060 Andrew Drive  
Suite 140  
West Chester PA 19380

Report Date: November 03, 2016

**Project: Marcus Hook Annual Perimeter Sampling**Submittal Date: 10/18/2016  
Group Number: 1724043  
PO Number: MARCUS HOOK  
State of Sample Origin: PAClient Sample DescriptionTRIP BLANK Water  
EB-20161017 Grab Groundwater  
MW-295-20161017 Grab Groundwater  
MW-28-20161017 Grab Groundwater  
MW-29-20161017 Grab Groundwater  
MW-30-20161017 Grab Groundwater  
MW-24-20161017 Grab Groundwater  
MW-8-20161018 Grab Groundwater  
MW-6-20161018 Grab Groundwater  
MW-129-20161018 Grab Groundwater  
MW-581-20161018 Grab Groundwater

Lancaster Labs

(LL) #

8657463  
8657464  
8657465  
8657466  
8657467  
8657468  
8657469  
8657470  
8657471  
8657472  
8657473

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Stantec  
Electronic Copy To Sunoco c/o StantecAttn: Andrew Bradley  
Attn: Jennifer Menges

Respectfully Submitted,



Amek Carter  
Specialist

(717) 556-7252

Sample Description: TRIP BLANK Water  
Marcus Hook

LL Sample # WW 8657463  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/06/2016

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

MHK17

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>Volatiles by Extraction</b>	<b>SW-846 8011</b>	<b>ug/l</b>	<b>ug/l</b>		
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 11:29	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 11:29	Anita M Dale	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 16:12	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1

Sample Description: EB-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657464  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 07:50 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

EB-17

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/l</b>					
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C ug/l</b>					
14249	Anthracene	120-12-7	N.D.	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	N.D.	0.1	1
14249	Naphthalene	91-20-3	N.D.	0.1	1
14249	Phenanthrene	85-01-8	N.D.	0.1	1
14249	Pyrene	129-00-0	N.D.	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011 ug/l</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1
<b>Metals Dissolved SW-846 6020 ug/l</b>					
06035	Lead	7439-92-1	N.D.	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 11:51	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 11:51	Anita M Dale	1

Sample Description: EB-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657464  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 07:50 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

EB-17

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 11:03	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 16:28	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 18:54	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

**Sample Description:** MW-295-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657465  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 09:20 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

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295--

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1

<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270C</b>	<b>ug/l</b>	<b>ug/l</b>	
14249	Anthracene	120-12-7	N.D.	0.5	1
14249	Benzo(a)anthracene	56-55-3	0.7 J	0.5	1
14249	Benzo(a)pyrene	50-32-8	0.9 J	0.5	1
14249	Benzo(b)fluoranthene	205-99-2	1 J	0.5	1
14249	Benzo(g,h,i)perylene	191-24-2	1 J	0.5	1
14249	Chrysene	218-01-9	1 J	0.5	1
14249	Fluorene	86-73-7	N.D.	0.5	1
14249	Naphthalene	91-20-3	2 J	0.5	1
14249	Phenanthrene	85-01-8	2 J	0.5	1
14249	Pyrene	129-00-0	2 J	0.5	1

Reporting limits were raised due to interference from the sample matrix.

The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<b>Volatiles by Extraction</b>	<b>SW-846 8011</b>	<b>ug/l</b>	<b>ug/l</b>	
10398 Ethylene dibromide	106-93-4	N.D.	0.0092	1
<b>Metals Dissolved</b>	<b>SW-846 6020</b>	<b>ug/l</b>	<b>ug/l</b>	
06035 Lead	7439-92-1	N.D.	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 12:13	Anita M Dale	1

Sample Description: MW-295-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657465  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 09:20 by DH

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1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

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## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 12:13	Anita M Dale	1
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 11:31	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 16:59	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 18:56	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

**Sample Description:** MW-28-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657466  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 10:25 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

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CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/l</b>					
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C ug/l</b>					
14249	Anthracene	120-12-7	N.D.	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	N.D.	0.1	1
14249	Naphthalene	91-20-3	0.1 J	0.1	1
14249	Phenanthrene	85-01-8	N.D.	0.1	1
14249	Pyrene	129-00-0	0.1 J	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011 ug/l</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1
<b>Metals Dissolved SW-846 6020 ug/l</b>					
06035	Lead	7439-92-1	0.11 J	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 12:35	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 12:35	Anita M Dale	1



Sample Description: MW-28-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657466  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 10:25 by DH

Stantec  
1060 Andrew Drive  
Suite 140  
West Chester PA 19380

Submitted: 10/18/2016 17:55

Reported: 11/03/2016 13:39

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## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 11:59	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 17:14	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 18:58	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

**Sample Description:** MW-29-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657467  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:00 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

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CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/l</b>					
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	1 J	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C ug/l</b>					
14249	Anthracene	120-12-7	0.1 J	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	0.1 J	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	0.2 J	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	0.1 J	0.1	1
14249	Chrysene	218-01-9	0.2 J	0.1	1
14249	Fluorene	86-73-7	0.2 J	0.1	1
14249	Naphthalene	91-20-3	N.D.	0.1	1
14249	Phenanthrene	85-01-8	0.2 J	0.1	1
14249	Pyrene	129-00-0	0.4 J	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011 ug/l</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0096	1
<b>Metals Dissolved SW-846 6020 ug/l</b>					
06035	Lead	7439-92-1	N.D.	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 12:56	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 12:56	Anita M Dale	1

Sample Description: MW-29-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657467  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:00 by DH

Stantec  
1060 Andrew Drive  
Suite 140  
West Chester PA 19380

Submitted: 10/18/2016 17:55

Reported: 11/03/2016 13:39

29---

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 12:27	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 17:30	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 18:59	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

**Sample Description:** MW-30-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657468  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:45 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

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CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>					
10945	Benzene	71-43-2	6	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	0.7 J	0.5	1
10945	Isopropylbenzene	98-82-8	0.5 J	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	1 J	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	1	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C</b>					
14249	Anthracene	120-12-7	N.D.	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	0.2 J	0.1	1
14249	Naphthalene	91-20-3	2	0.1	1
14249	Phenanthrene	85-01-8	0.2 J	0.1	1
14249	Pyrene	129-00-0	N.D.	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1
<b>Metals Dissolved SW-846 6020</b>					
06035	Lead	7439-92-1	0.22 J	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 13:18	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 13:18	Anita M Dale	1

Sample Description: MW-30-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657468  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:45 by DH

Stantec  
1060 Andrew Drive  
Suite 140  
West Chester PA 19380

Submitted: 10/18/2016 17:55

Reported: 11/03/2016 13:39

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## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 12:55	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 18:01	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 19:01	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

Sample Description: MW-24-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657469  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 13:40 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

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CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	0.8 J	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	0.8 J	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270C</b>	<b>ug/l</b>	<b>ug/l</b>	
14249	Anthracene	120-12-7	N.D.	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	0.1 J	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	N.D.	0.1	1
14249	Naphthalene	91-20-3	N.D.	0.1	1
14249	Phenanthrene	85-01-8	N.D.	0.1	1
14249	Pyrene	129-00-0	0.2 J	0.1	1

The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample surrogate(s) is <10% as noted on the QC Summary. The following corrective action was taken: The sample was re-extracted outside the method required holding time and the QC was acceptable. All results are reported from the first trial. Similar results were obtained in both trials with the exception of: several target compounds were detected in the re-extraction.

<b>Volatiles by Extraction</b>	<b>SW-846 8011</b>	<b>ug/l</b>	<b>ug/l</b>	
10398 Ethylene dibromide	106-93-4	N.D.	0.0094	1
<b>Metals Dissolved</b>	<b>SW-846 6020</b>	<b>ug/l</b>	<b>ug/l</b>	
06035 Lead	7439-92-1	0.24 J	0.090	1

Sample Description: MW-24-20161017 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657469  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 13:40 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

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## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 13:39	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 13:39	Anita M Dale	1
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 13:23	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 18:48	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 18:14	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3 modified	SW-846 3010A	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

**Sample Description:** MW-8-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657470  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 08:30 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

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CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/l</b>					
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	3	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	7	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C ug/l</b>					
14249	Anthracene	120-12-7	0.1 J	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	0.9	0.1	1
14249	Naphthalene	91-20-3	0.1 J	0.1	1
14249	Phenanthrene	85-01-8	1	0.1	1
14249	Pyrene	129-00-0	0.1 J	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011 ug/l</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1
<b>Metals Dissolved SW-846 6020 ug/l</b>					
06035	Lead	7439-92-1	0.61 J	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 14:01	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 14:01	Anita M Dale	1



Sample Description: MW-8-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657470  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 08:30 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

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## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 13:51	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 19:04	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016 19:03	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016 06:10	Lisa J Cooke	1

**Sample Description:** MW-6-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657471  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 09:25 by DH

Stantec

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Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

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CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/l</b>					
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	2	0.5	1
10945	Isopropylbenzene	98-82-8	1 J	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	0.7 J	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	9	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C ug/l</b>					
14249	Anthracene	120-12-7	2	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	7	0.1	1
14249	Naphthalene	91-20-3	2	0.1	1
14249	Phenanthrene	85-01-8	12	0.1	1
14249	Pyrene	129-00-0	2	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011 ug/l</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0094	1
<b>Metals Dissolved SW-846 6020 ug/l</b>					
06035	Lead	7439-92-1	N.D.	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 14:23	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 14:23	Anita M Dale	1

Sample Description: MW-6-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657471  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 09:25 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

6----

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 14:19	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 19:19	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050003A	11/03/2016 05:00	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050003	10/30/2016 07:22	James L Mertz	1

**Sample Description:** MW-129-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657472  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 10:45 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

-129-

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>					
10945	Benzene	71-43-2	N.D.	0.5 ug/l	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	0.9 J	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	7	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
<b>GC/MS Semivolatiles SW-846 8270C</b>					
14249	Anthracene	120-12-7	0.3 J	0.1 ug/l	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	0.1 J	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	2	0.1	1
14249	Naphthalene	91-20-3	0.1 J	0.1	1
14249	Phenanthrene	85-01-8	N.D.	0.1	1
14249	Pyrene	129-00-0	0.9	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0095 ug/l	1
<b>Metals Dissolved SW-846 6020</b>					
06035	Lead	7439-92-1	N.D.	0.090 ug/l	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 14:45	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 14:45	Anita M Dale	1

Sample Description: MW-129-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657472  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 10:45 by DH

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1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

-129-

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 14:47	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 19:35	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050003A	11/03/2016 05:01	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050003	10/30/2016 07:22	James L Mertz	1

**Sample Description:** MW-581-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657473  
LL Group # 1724043  
Account # 16657

**Project Name:** Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 11:30 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

-581-

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/l</b>					
10945	Benzene	71-43-2	520	5	10
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	400	5	10
10945	Isopropylbenzene	98-82-8	53	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	2	0.5	1
10945	Toluene	108-88-3	37	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	200	5	10
10945	1,3,5-Trimethylbenzene	108-67-8	75	0.5	1
10945	Xylene (Total)	1330-20-7	1,800	5	10
<b>GC/MS Semivolatiles SW-846 8270C ug/l</b>					
14249	Anthracene	120-12-7	0.2 J	0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.	0.1	1
14249	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	1
14249	Chrysene	218-01-9	N.D.	0.1	1
14249	Fluorene	86-73-7	0.9	0.1	1
14249	Naphthalene	91-20-3	52	0.1	1
14249	Phenanthrene	85-01-8	1	0.1	1
14249	Pyrene	129-00-0	0.6	0.1	1
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
<b>Volatiles by Extraction SW-846 8011 ug/l</b>					
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1
<b>Metals Dissolved SW-846 6020 ug/l</b>					
06035	Lead	7439-92-1	82.5 B	0.090	1

## Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 15:07	Anita M Dale	1
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 16:58	Anita M Dale	10

Sample Description: MW-581-20161018 Grab Groundwater  
Marcus Hook

LL Sample # WW 8657473  
LL Group # 1724043  
Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 11:30 by DH

Stantec

1060 Andrew Drive

Submitted: 10/18/2016 17:55

Suite 140

Reported: 11/03/2016 13:39

West Chester PA 19380

-581-

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 15:07	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	F163012AA	10/27/2016 16:58	Anita M Dale	10
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016 15:15	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016 17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 19:50	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050003A	11/03/2016 05:03	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050003	10/30/2016 07:22	James L Mertz	1

## Quality Control Summary

Client Name: Stantec  
Reported: 11/03/2016 13:39

Group Number: 1724043

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

## Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: F163012AA	Sample number(s): 8657463-8657473	
Benzene	N.D.	0.5
1,2-Dichloroethane	N.D.	0.5
Ethylbenzene	N.D.	0.5
Isopropylbenzene	N.D.	0.5
Methyl Tertiary Butyl Ether	N.D.	0.5
Toluene	N.D.	0.5
1,2,4-Trimethylbenzene	N.D.	0.5
1,3,5-Trimethylbenzene	N.D.	0.5
Xylene (Total)	N.D.	0.5
Batch number: 16298WAD026	Sample number(s): 8657464-8657473	
Anthracene	N.D.	0.1
Benzo(a)anthracene	N.D.	0.1
Benzo(a)pyrene	N.D.	0.1
Benzo(b)fluoranthene	N.D.	0.1
Benzo(g,h,i)perylene	N.D.	0.1
Chrysene	N.D.	0.1
Fluorene	N.D.	0.1
Naphthalene	N.D.	0.1
Phenanthrene	N.D.	0.1
Pyrene	N.D.	0.1
Batch number: 162980034A	Sample number(s): 8657463-8657473	
Ethylene dibromide	N.D.	0.010
Batch number: 163026050002A	Sample number(s): 8657464-8657470	
Lead	N.D.	0.090
Batch number: 163026050003A	Sample number(s): 8657471-8657473	
Lead	0.12 J	0.090

## LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: F163012AA	Sample number(s): 8657463-8657473								
Benzene	20	19.33			97		78-120		

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



## Quality Control Summary

Client Name: Stantec  
Reported: 11/03/2016 13:39

Group Number: 1724043

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,2-Dichloroethane	20	16.1			80		66-128		
Ethylbenzene	20	17.61			88		78-120		
Isopropylbenzene	20	17.89			89		80-120		
Methyl Tertiary Butyl Ether	20	17.52			88		75-120		
Toluene	20	18.22			91		80-120		
1,2,4-Trimethylbenzene	20	18.34			92		75-120		
1,3,5-Trimethylbenzene	20	17.95			90		75-120		
Xylene (Total)	60	53.37			89		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16298WAD026	Sample number(s): 8657464-8657473								
Anthracene	50	47.54	50	45.18	95	90	70-130	5	30
Benzo(a)anthracene	50	49.14	50	47.75	98	95	70-130	3	30
Benzo(a)pyrene	50	47.97	50	46.12	96	92	70-130	4	30
Benzo(b)fluoranthene	50	48.81	50	46.42	98	93	70-130	5	30
Benzo(g,h,i)perylene	50	49.88	50	48.33	100	97	70-130	3	30
Chrysene	50	50.86	50	49.43	102	99	70-130	3	30
Fluorene	50	45.77	50	44.36	92	89	70-130	3	30
Naphthalene	50	40.22	50	39.27	80	79	70-130	2	30
Phenanthrene	50	46.96	50	45.32	94	91	70-130	4	30
Pyrene	50	48.05	50	47.01	96	94	70-130	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 162980034A	Sample number(s): 8657463-8657473								
Ethylene dibromide	0.128	0.134	0.128	0.132	105	103	60-140	1	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163026050002A	Sample number(s): 8657464-8657470								
Lead	15	16.1			107		80-120		
Batch number: 163026050003A	Sample number(s): 8657471-8657473								
Lead	15	15.76			105		80-120		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: F163012AA	Sample number(s): 8657463-8657473 UNSPK: P655663									
Benzene	N.D.	20	20.4	20	21.1	102	106	78-120	3	30
1,2-Dichloroethane	N.D.	20	16.3	20	17.27	81	86	66-128	6	30
Ethylbenzene	N.D.	20	18.66	20	19.88	93	99	78-120	6	30

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Stantec  
Reported: 11/03/2016 13:39

Group Number: 1724043

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Isopropylbenzene	N.D.	20	19.14	20	20.43	96	102	80-120	6	30
Methyl Tertiary Butyl Ether	N.D.	20	17.28	20	17.72	86	89	75-120	3	30
Toluene	N.D.	20	18.55	20	20.02	93	100	80-120	8	30
1,2,4-Trimethylbenzene	N.D.	20	18.94	20	17.75	95	89	75-120	6	30
1,3,5-Trimethylbenzene	N.D.	20	19.36	20	19.68	97	98	75-120	2	30
Xylene (Total)	N.D.	60	56.11	60	59.82	94	100	80-120	6	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 162980034A	Sample number(s): 8657463-8657473 UNSPK: 8657467									
Ethylene dibromide	N.D.	0.122	0.121			99		60-140		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 163026050002A	Sample number(s): 8657464-8657470 UNSPK: 8657469									
Lead	0.238	15	16.06	15	15.85	105	104	75-125	1	20
Batch number: 163026050003A	Sample number(s): 8657471-8657473 UNSPK: P650454									
Lead	0.119	15	16.05	15	16.09	106	106	75-125	0	20

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 162980034A	Sample number(s): 8657463-8657473 BKG: 8657464			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	ug/l	ug/l		
Batch number: 163026050002A	Sample number(s): 8657464-8657470 BKG: 8657469			
Lead	0.238	0.235	1 (1)	20
Batch number: 163026050003A	Sample number(s): 8657471-8657473 BKG: P650454			
Lead	0.119	0.110	7 (1)	20

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs  
Batch number: F163012AA

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Stantec  
Reported: 11/03/2016 13:39

Group Number: 1724043

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8657463	96	102	98	91
8657464	98	102	97	94
8657465	98	102	98	94
8657466	97	100	97	93
8657467	96	100	98	94
8657468	96	99	99	95
8657469	97	103	98	95
8657470	98	101	99	94
8657471	98	103	99	95
8657472	98	102	97	95
8657473	97	98	96	102
Blank	98	100	99	93
LCS	98	103	98	95
MS	98	103	98	96
MSD	98	102	99	96
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs 8270C MINI  
Batch number: 16298WAD026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8657464	45*	55*	51*
8657465	58*	60*	30*
8657466	78	81	62*
8657467	71	74	62*
8657468	70	72	59*
8657469	5*	5*	5*
8657470	61*	67*	59*
8657471	59*	63*	53*
8657472	77	81	53*
8657473	63*	62*	44*
Blank	70	78	83
LCS	75	79	82
LCSD	75	77	73
Limits:	70-130	70-130	70-130

Analysis Name: EDB in Wastewater  
Batch number: 162980034A

	1,1,2,2-Tetrachloroethane
8657463	104
8657464	112
8657465	94
8657466	106
8657467	102
8657468	116
8657469	117

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Stantec  
Reported: 11/03/2016 13:39

Group Number: 1724043

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	1,1,2,2-Tetrachloroethane
8657470	115
8657471	123
8657472	109
8657473	102
Blank	110
DUP	100
LCS	115
LCSD	111
MS	110
Limits:	46-136

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

# Environmental Analysis Request/Chain of Custody



Lancaster Laboratories  
Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 116657 Group # 1724043 Sample # 8657463-73

COC # 511948

Client Information				Matrix				Analysis Requested										For Lab Use Only				
Client: <u>Stantec</u>		Acct. #:		<input type="checkbox"/> Tissue	<input checked="" type="checkbox"/> Ground	<input type="checkbox"/> Surface	<input type="checkbox"/> Potable	<input type="checkbox"/> NPDES	<input type="checkbox"/> Other: <u>blank</u>	Total # of Containers	Preservation Codes										FSC: _____	SCR#: _____
Project Name/ #: <u>213402430</u>		PWSID #:																			Preservation Codes	
Project Manager: <u>Jennifer Merges</u>		P.O. #:												H=HCl      T=Thiosulfate		Remarks						
Sampler: <u>Dane Hopkins</u>		Quote #:												N=HNO <sub>3</sub> B=NaOH								
State where samples were collected: <u>Pa</u>		For Compliance: Yes <input type="checkbox"/> No <input type="checkbox"/>												S=H <sub>2</sub> SO <sub>4</sub> O=Other								
Sample Identification		Collected		Grab	Composite	Soil <input type="checkbox"/>	Water	Other: <u>blank</u>	Total # of Containers	Evergreen Comprehensive List	EDB Soil											
		Date	Time																			
TRIP BLANK		10/16/16	—						4	X	X											
EB-20161017		10/17/16	0750						8	X	X											
MW-245-20161017			0920	X			X		8	X	X											
MW-28-20161017			1025	X			X		8	X	X											
MW-29-20161017			1100	X			X		8	X	X											
MW-30-20161017			1145	X			X		8	X	X											
MW-24-20161017			1340	X			X		8	X	X											
MW-8-20161018		10/18/16	0830	X			X		8	X	X											
MW-6-20161018			0925	X			X		8	X	X											
MW-129-20161018			1045	X			X		8	X	X											

  

Turnaround Time (TAT) Requested (please circle)		Relinquished by: <u>[Signature]</u>		Date: <u>10/18/16</u>	Time: <u>1325</u>	Received by: <u>[Signature]</u>	Date: <u>10/18/16</u>	Time: <u>1325</u>
Standard      Rush		Relinquished by: <u>[Signature]</u>		Date: <u>10/18/16</u>	Time: <u>1656</u>	Received by: <u>[Signature]</u>	Date: <u>10/18/16</u>	Time: <u>1656</u>
(Rush TAT is subject to laboratory approval and surcharge.)		Relinquished by: <u>[Signature]</u>		Date: _____	Time: _____	Received by: _____	Date: _____	Time: _____
Date results are needed: _____		Relinquished by: _____		Date: _____	Time: _____	Received by: _____	Date: _____	Time: _____
E-mail address: <u>Jennifer.Merges@stantec.com</u>		Relinquished by: _____		Date: _____	Time: _____	Received by: _____	Date: _____	Time: _____
Data Package Options (circle if required)		Relinquished by: _____		Date: _____	Time: _____	Received by: <u>Cathy Ziegler</u>	Date: <u>10/18/16</u>	Time: <u>17:55</u>
Type I (EPA Level 3 Equivalent/non-CLP)		Type VI (Raw Data Only)		EDD Required? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Relinquished by Commercial Carrier:		
Type III (Reduced non-CLP)		NJ DKQP      TX TRRP-13		If yes, format: <u>EQUS</u>		UPS _____ FedEx _____ Other _____		
NYSDEC Category A or B		MA MCP      CT RCP		Site-Specific QC (MS/MSD/Dup)? Yes <input type="checkbox"/> No <input type="checkbox"/>		Temperature upon receipt <u>1.5-1.8</u>		
				(If yes, indicate QC sample and submit triplicate sample volume.)				

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0216



**Lancaster Laboratories  
Environmental**

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 16657 Group # 1724043 Sample # 8657463-73

COC #511949

[illegible]

G-1720  
1724043  
QMS 10/24/16

## Evergreen Petroleum Short List (June 2016)

VOCs by EPA Method 8260	CAS No.
Benzene	71-43-2
Cumene	98-82-8
Dichloroethane, 1,2-	107-06-2
Ethylbenzene	100-41-4
Ethylene Dibromide*	106-93-4
Methyl tert butyl ether	1634-04-4
Toluene	108-88-3
Trimethylbenzene, 1,2,4-	95-63-6
Trimethylbenzene, 1,3,5-	108-67-8
Xylenes	1330-20-7

SVOCs by EPA Method 8270	CAS No.
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(a)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Chrysene	218-01-9
Fluorene	86-73-7
Naphthalene**	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0

Metals by Method 6010/6020	CAS No.
Lead***	7439-92-1

\*Ethylene Dibromide (EDB) should be analyzed by Method 8011 instead of 8260 in soil for tank investigations and in **all groundwater samples**. EDB in all trip blank samples should be analyzed by 8260 regardless of method used for primary samples.

\*\*Naphthalene should be analyzed by EPA Method 8260 instead of 8270 for tank investigations.

\*\*\*Metals analysis should be total in soil and dissolved in groundwater.

This list is comprised of the combined PADEP Short List of Petroleum Products (leaded and unleaded gasoline and No. 1, 2, 4, 5, 6 Fuel Oils).

Client: Stantec

Delivery and Receipt Information

Delivery Method:ELLE Courier

Arrival Timestamp:10/18/2016 17:55

Number of Packages:2

Number of Projects:1

State/Province of Origin:PA

Arrival Condition Summary

Shipping Container Sealed:Yes

Custody Seal Present:Yes

Custody Seal Intact:Yes

Samples Chilled:Yes

Paperwork Enclosed:Yes

Samples Intact:Yes

Missing Samples:No

Extra Samples:No

Discrepancy in Container Qty on COC:No

Sample IDs on COC match Containers:Yes

Sample Date/Times match COC:Yes

VOA Vial Headspace ≥ 6mm:N/A

Total Trip Blank Qty:2

Trip Blank Type:HCl

Air Quality Samples Present:No

Unpacked by Cathy Murphy (10960) at 18:37 on 10/18/2016

Samples Chilled Details

Thermometer Types:DT = Digital (Temp. Bottle)IR = Infrared (Surface Temp)All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.5	DT	Wet	Y	Bagged	N
2	DT146	1.9	DT	Wet	Y	Bagged	N



# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mg</b>	milligram(s)
<b>C</b>	degrees Celsius	<b>mL</b>	milliliter(s)
<b>cfu</b>	colony forming units	<b>MPN</b>	Most Probable Number
<b>CP Units</b>	cobalt-chloroplatinate units	<b>N.D.</b>	none detected
<b>F</b>	degrees Fahrenheit	<b>ng</b>	nanogram(s)
<b>g</b>	gram(s)	<b>NTU</b>	nephelometric turbidity units
<b>IU</b>	International Units	<b>pg/L</b>	picogram/liter
<b>kg</b>	kilogram(s)	<b>RL</b>	Reporting Limit
<b>L</b>	liter(s)	<b>TNTC</b>	Too Numerous To Count
<b>lb.</b>	pound(s)	<b>µg</b>	microgram(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
<b>meq</b>	milliequivalents	<b>umhos/cm</b>	micromhos/cm
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

## Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value  $\geq$  the Method Detection Limit (MDL or DL) and  $<$  the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column  $>40\%$ . The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column  $>100\%$ . The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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## Additional Data Qualifiers

Qualifier	Definition
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD